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The only legitimate distinctions that can be recognized will be those called for by the stage of development.

What is a stage of development? If we should trace the growth of a child from infancy to adolescence, what periods of physical growth should we find? Are there any corresponding, or related, mental periods of development? Does a group of children in the kindergarten ranging in age from three to six years include more than one stage of growth? These are some of the questions that come up in investigating the typical conditions necessary for growth.

In the kindergarten the teacher's problem is just that of every teacher. She must study the children and study the conditions; she must find the fundamental needs and ways to satisfy them. She must learn to recognize the distinctive characteristics and needs of the children in certain stages and the peculiar traits and

needs of particular children. After this she must plan an ideal environment for her little community. The children themselves are her laboratory. She can find little help apart from them save in the laboratory of her own consciousness. This inner field of investigation furnishes the type of all activity at all stages, but each stage has its own variations in the form of predominating images and impulses.

The limitation in the number and fullness of children's images is the determining factor in our choice of conditions for each group.

The impulses to act in certain ways partly determine the form of exercise which shall be guided by the teacher. Two questions follow: What are the controlling impulses to activity at three years and at six? What is the range of images and what have these images to do with action at each stage?

Pedagogics of Nature Study

Wilbur S. Jackman

Query: What is the relation of Nature Study to Natural Science?

In the earlier days of Nature Study in the elementary schools, men of science were strenuous in their protest against calling either the subject science, or its methods. The objections urged may have been valid in some degree against the crude or rudimentary methods employed in the beginning, but they cannot be successfully maintained against the study when properly conducted. Nature Study, well planned, is scientific, and it differs not a whit in its essentials from Natural Science. The obvious truth of this may be shown easily by a consideration of the matter and method in both.

1. In Natural Science the subject-matter

is found in the great domain of nature; earth, air, sky, and water are the sources of the materials studied. Outside of these, in Natural Science, there is nothing to study.

2. In Nature Study the materials are derived from the same exhaustless realm.

3. In Natural Science the study rests upon the personal investigations of the student, and it is his own observations that measure the rate and amount of his progress.

4. In Nature Study, no less than in Natural Science, personal investigations and observations are fundamental.

5. In the study of Natural Science the senses are of primary importance.

6. In Nature Study, the use of the senses is no less essential.

7. In Natural Science the student seeks through a study of natural phenomena the law or laws that express the order of the whole.

8. Nature Study, properly understood, suggests to the youngest child some relationships that give a clue to law. The suggestion of law is the only natural stimulus in any study. The age of the pupil is irrelevant.

There is no natural dividing-line, therefore, between the student of Natural Science and the pupil in Nature Study. The motive, matter, and method in Natural Science and Nature Study are the same, but in instruction there are differences in the application of the common principles.

1. The child's senses are untrained; he observes less of detail than the better trained student of nature.

2. In Nature Study larger masses, therefore, must be presented to the child than would be necessary in the case of the advanced student. The sights must be more striking, the weights, relatively, heavier, the movements more pronounced, the functions more obvious.

3. In Natural Science the better trained student discovers minuter details and recognizes more delicate relations.

4. Hence to the beginner the outdoor study is of maximum and the laboratory is of minimum importance; but to the advanced student, if he can carry his outdoor experience with him, the laboratory becomes relatively of greater importance.

5. Quantitative results in Nature Study are possible and proper in any particular field of study where the student of Natural Science would find it necessary to obtain them. But where the advanced student might obtain the desired information by the analysis of a single leaf, or of a drop of water or an ounce of earth, the beginner in Nature Study must use bushels, gallons and pounds. This for two reasons: First, the beginner must deal with large quantities if he is to image properly; and second, the liability to loss during the experiment, owing to lack of skill in manipulation, is greater. True Nature Study, therefore, is Natural Science, and its methods are all scientific. The student in the latter should not find it necessary to unlearn, ignore, or forget what he learned in the former.

Physiology of Nutrition

Ira B. Meyers

(WITH SPECIAL REFERENCE TO THE HUMAN BODY.)

Ninth Grade: The Physiology for the quarter is a study of the animal organism as related to nutrition.

The structure of the digestive organs of any animal is determined by the nature of the food consumed. The food material is more or less solid and insoluble, and is for the most part of a composition differing from the tissues it is intended to build or repair. The function of the organs of digestion is to change the food so that

it may be utilized by the tissues of the body.

This series of changes involves two processes—a physical one by which the food is triturated, moved along the digestive tract, and mixed with certain fluids, and a chemical process which changes insoluble substances into soluble ones, thus modifying the food in such a way that the larger part eaten passes directly or indirectly into the blood.